Using the Power of the Network

Organizational and Cultural Change

Material derived, in part, from the NDIA FORCEnet Study
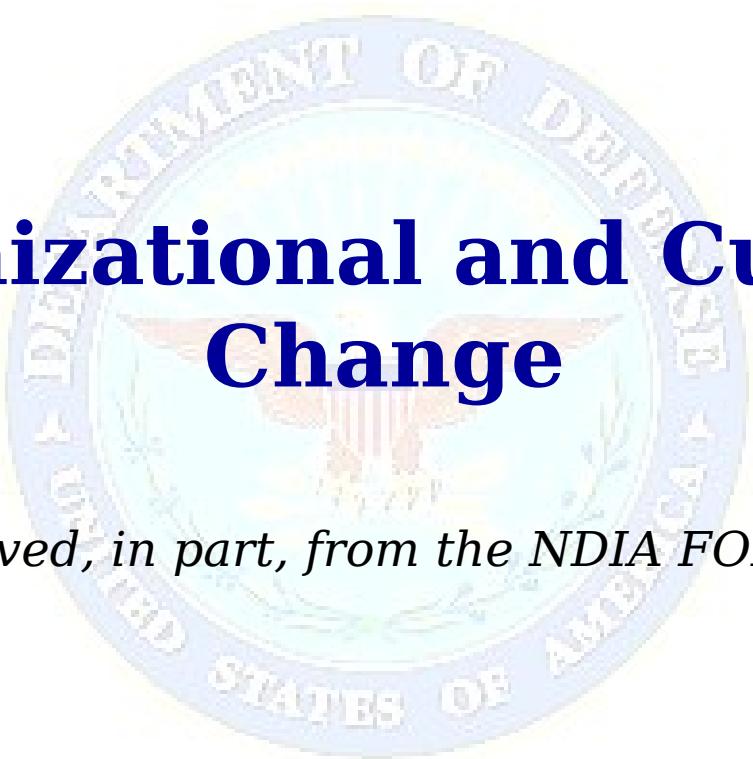
Christine MacNulty.
Applied Futures.
15 October 2004

Operations

Cognitive Domain

- A robustly networked force improves information sharing
- Information sharing and collaboration enhances the quality of information and shared situational awareness
- Shared situational awareness enables collaboration and self synchronization, and enhances sustainability and speed of command
- These in turn dramatically increase mission effectiveness

**Quality of Information** · **New Processes** · **Mission Effectiveness**

Robustly Networked Force **Information Sharing** **Shared Situational Awareness** **Self Synchronization**

Collaboration

Information Domain **Cognitive Domain** **Physical Domain**
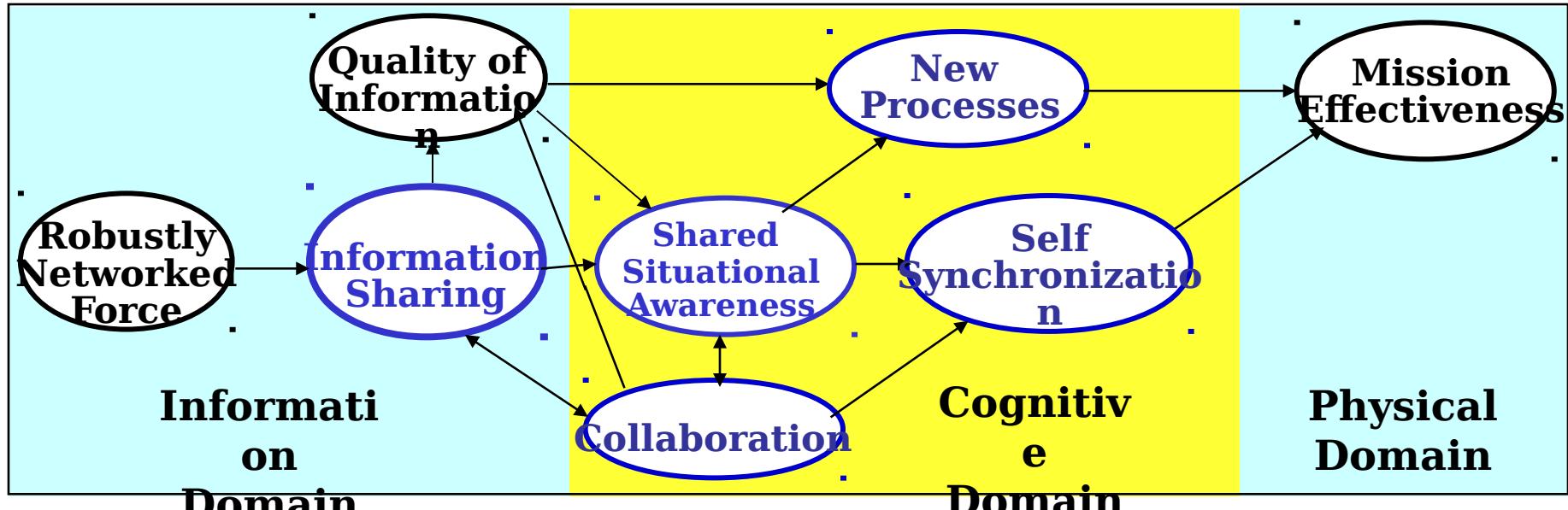
Bottom Line

- To examine new types of organizational structures, command structures and problems with them
- To provide an understanding of cultures, the characteristics of an NCO culture, and potential barriers
- To indicate how organizations will need to transform in order to operate effectively in an NCO environment
- To take a first look at future systems' design considerations from an organizational perspective

New Organization and Command Structures?*
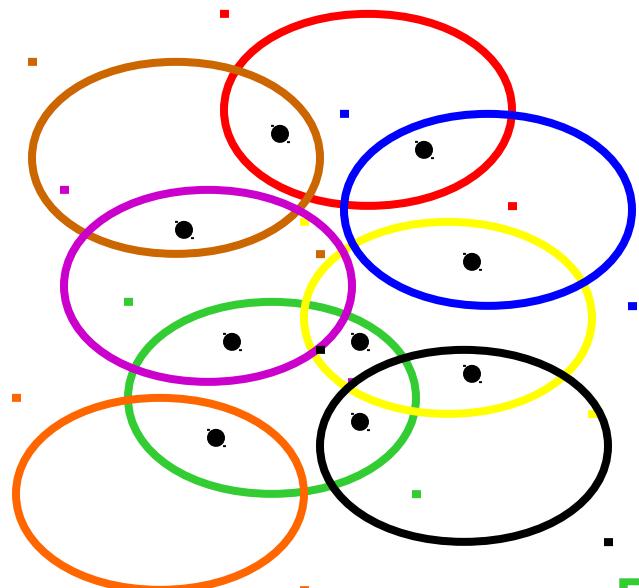
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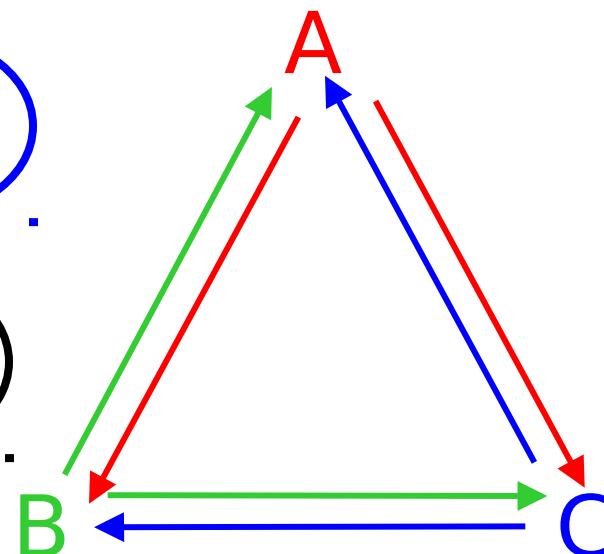
SITUATIONAL CONTROL

A

B

C
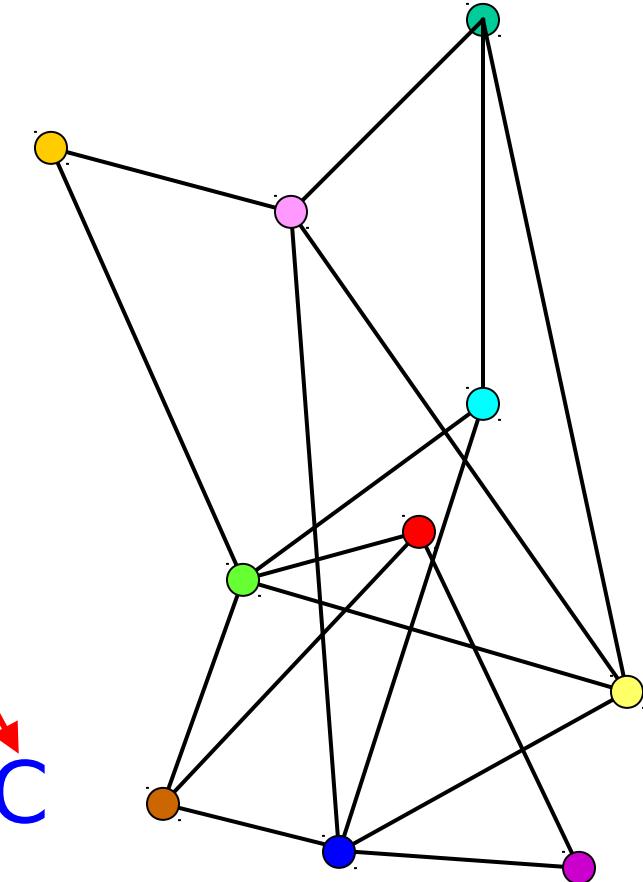
NETWORK

This slide was first prepared in 1978 – but will these structures work?
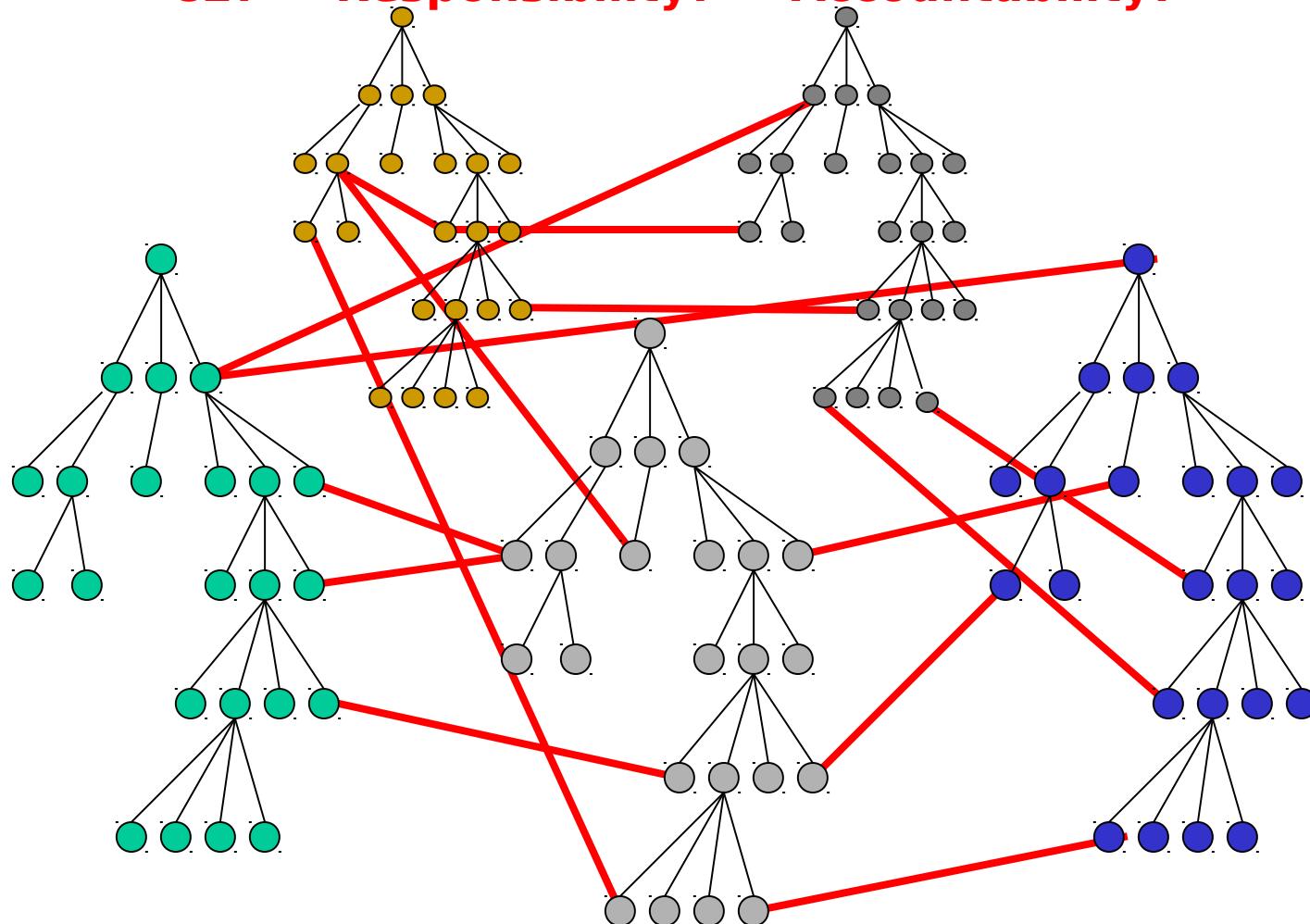
Command & Control

Command – The Art of War?

- **The creative expression of human will necessary to accomplish the mission***

Control – The Science of War?

- **Those structures and processes devised by command to enable it and manage risk***

* Pigeau and McCann, <u>Re-conceptualizing Command and Control</u>, *Canadian Military Journal,* Vol. 3, No. 1, Spring, 2002

Warfare "Then" "Gulf War I" the Arabian Gulf, 1991

Iraq

Basrah ★

E-2

Kuwait

Kuwait City ★

MOBILE BAY (AAWC -- ZW)(Data Link Control)(FOTC)(NAG ASUW AC SI

★Shiraz

● COMDESRON in DD (NAG ASUWC)

★Bushehr

★
E-3
KKMC ★

Farsi Is
★

**Iran**

Saudi Arabia

Al Jubayl ★

●AG ASUWC in RANGER Bandar Abbas★

COMSEVENTHFLT in BLUE RIDGE
★ (COMUSNAVCENT)

● COMMANDER BF ZULU (CTF 154) in MIDWAY

Dhahran ★

●

Riyadh

CVOA ● TR

Bahrain

● AMERICA

- **Segregated Air Picture along shore line, creating Track Production Areas --**
- **Unreliable Surface Picture in the Arabian Gulf --- NO continuous coverage, no real confidence by Commanders in the validity of the picture**
- **Thus --- Rules of Engagement required visual confirmation as hostile to kill**

Oman

Characteristics of the NCO Culture

Collaboration and cooperation become key

- **To enable people and organizations to share and utilize their knowledge and expertise**
- **Build a team of subject matter experts (Reservists?) to have on call**

New organizational structures that are flexible and adaptable

- **Flatter hierarchies tend to generate overlapping roles and missions – leading to confusion over command and accountability**
- **Network-type organizations may not be the answer – as responsibility and accountability is not clear**
  - **Rather, networked relationships within and between hierarchies**
- **Cross functional, geographically displaced and frequently**

Cross-Functional Task Initiating Role Relationships*

Components Of TIRRs	Accountability and Authority	A can instruct B to do something	A can instruct B to stop, B stops	A can instruct B to delay, B delays	A and B disagree, A decides	A can be informed about B's work	A can have access to persuade B	A can have access to explain to B	A can call coordinative meetings with Bs	A can report higher about B	If A, B disagree, follow Commander's Intent
Prescribe	★	★	★	★	★	★	★			★	
Audit		★	★	★	★	★	★			★	
Coordinative			★			★	★	★	★	★	
Monitoring			★			★	★	★		★	
Service-Getting	★									★	
Advisory							★				
Collateral						★	★				★

* Elliott Jaques, *Requisite Organization*

Characteristics of the NCO Culture

- Motivation and reward systems revamped
  - **Incentives for innovation – money, prizes…**
  - **Rewards for team versus individual performance**
  - **'Permission to reflect' – time to assimilate information, to communicate with colleagues, and make better decisions by creating, sharing, and utilizing knowledge**
    - Time to view the K-web (or something similar), to use chat, and to post information

- Attitudes to risk and failure
  - **Risk needs to be accepted and become part of the job – with guidelines on how much can be tolerated**
  - **In innovative and creative organizations, failure should be accepted**
    - Zero defects mentality stifles innovation

Barriers

Cultural barriers to maturity as a Network Centric Culture

- **Tradition and organizational structures that are inconsistent with information sharing, and new ways of doing things, typically:**
  - Budgeting and accounting processes
  - Acquisition processes
  - Organizations that deal with policy
    - Organizational
    - Legal…etc.
- **Lack of common goals for collaboration**
- **Inadequate reward systems to support collaboration**
- **Lack of trust in other organizations, individuals, and systems**
- **Lack of perceived mutual benefit to participate in collaboration efforts**
- **Innovation is not rewarded**
- **Failure is punished**

Recommendations

Recommendations:

- **The clear, unambiguous Commander's Intent (Auftragstaktik) will be the way the organization is directed**
- **Values of the organization need to change to reflect the reliance on people, knowledge, and information**
- **The organization structure itself may need to change, although flatter hierarchies and networks are probably not the answer**
- **Relationships with other organizations in the network need to be established in such a way that authority and responsibility are clear and unambiguous**
- **New processes will need to be developed that reflect the new approaches, for:**
  - Acquisition
  - Budgeting
  - Policy
  - Systems Engineering
    - Design
    - Development

Relationships – Changing Culture

Prerequisite:

- A visionary leader who sees the need for change, and who is willing to carry it out
- A vision and strategic plan for the new organization that is truly shared by the leadership of the organization and its component divisions
- An approach to developing the component division visions and strategies so that they are in alignment with the overall vision
- Direction – What – not How
- Few rules and policies

Recommendations:

- Interactive workshops with the organization and component division leadership to elicit the vision and strategic plan in such a way as to encourage buy-in and commitment
  - Ideally the whole group should develop the vision and strategic plan
  - If the Commander of the organization already has a vision, then it needs to be as open and "unfinished" as possible, to enable people to interpret it for their own parts of the organization, and to identify how they can contribute best

The Strategic Planning Process
(Useful in Changing Cultures)

Vision

Roles & Missions

Policies / Constraints

Top-Level Goals

Objectives

Strategies

Action Plan

Implementation

CONSENSUS

COMMITMENT

Periodic Feedback

Periodic Feedback

Relationships – New Ideas*

Connectivity accelerates change, and makes systems more volatile and chaotic
- **Leads to less predicting and organizing, and**
- **More sensing and responding**
- **Planning must be fluid – continuous, adaptive**
- **Development will need to be continuously developing – not planned and fixed for the duration of the project**

Shift from Mechanistic to Biological Organizational Structures, which gives:
- **Self-organization**
- **Recombination – new from existing (mutations)**
- **Selection – fit/unfit**
- **Co-evolution – old and new exist and interact**
- **Emergence – with outcomes that are not predictable**

* Chris Meyer & Stan Davis, *It's Alive*

Relationships – New Ideas*

Complex problems will be solved by "devices" with simple rules derived from

- **Agent-based modeling**
- **Genetic algorithms...**
- **British Telecom uses a system of this sort (developed using agent-based modeling) to dispatch service reps – saving $170 million per year**
- **Models to dispatch predator drones – only 2 "rules" – greed and repulsion**
- **Modeling and Simulation will be key to this**

* **Chris Meyer & Stan Davis, *It's Alive***

Aspects of Organizational Change

Organizational Culture	Existing	Transformed for NCO
"Corporate"/ Command Plans	Directive – "What" to do, and sometimes the "How" to do it	**Guidelines – Clear Commander's Intent – freedom to do the "How"**
Planning Process	Periodic long-term and short-term operational planning	**Continuous, adaptive planning process – Sense and respond (by Intent)**
Information	Source of power – held closely	**Shared freely – the more the better**
Competition	Seen as advantageous – keeps people on their toes	**Seen as damaging – collaboration is better**
Attitude to Change	Resisted until inevitable – then too little too late	**Embraced – seen as a way of life**
Attitude to Risk	To be avoided	**To be handled as a natural part of the job**
Decision Making in Planning Cycle	Individual	**Group Participation – bring together**

Aspects of Organizational Change

Organizational Management	**Existing**	**Transformed for NCO**
Organizational Structure	Hierarchical pyramid	**Adaptive, network relationships – even across hierarchies**
Behavior	Determined by role in organization	**Determined by emergent function requirements and cross-functional relationships**
Role of Manager/Leader	Expert, Director	**Provider of Intent, Facilitator, Guide**
Role of Manager/Leader	Manage internally – direct functions	**Manage at the bounds between organizations – especially relationships**
Participative Management /	De-emphasized	**Primary focus for**

Aspects of Organizational Change

Organizational Development	Existing	Transformed for NCO
Organizational Concern	People look after selves and parent unit	**Distributed organization and other people look after each other within and across organizations**
Networking	Important for individual achievement	**Important for relationships, and group performance**
Motivation	Getting ahead, ambition	**Benefit to the group, the "customer"… Service**
Interpersonal focus	Task oriented	**Relationship oriented**
Career and personal	Dependent on	**Greater mobility**

Aspects of Organizational Change

Motivation & Rewards	Existing	Transformed for NCO
Reward Systems	Individual Based (Independence)	**Group Based (Interdependence)**
Reward System	Penalizes risk-taking – zero-defects mentality (in tactical sense). This does not include safety engineering.	**Rewards innovation and appropriate risk-taking**
Review Process	Hierarchical assessment and appraisal (often uncommunicated)	**Self-review and assessment plus mutual appraisal of performance and potential - communicated**
Amount of Rewards	Based on rank / position in organization	**Based on contribution to group results**

Aspects of Organizational Change

System Design	Existing	Transformed for NCO
Systems	Man the Equipment	**Equip the Man**
Systems	Mechanistic/industrial	**Biological**
Design	Human outside the system using the system	**Human-as-the-loop Human as the network**
Develop	Technology first – then train	**Co-evolve technology, people, organization and process**
Design	For optimization/ Efficiency	**For robustness, adaptability and versatility**
Interface	External HCI	**External HCI plus**

# Systems Design & Development: Considerations

NCO is about more than the networks and C4ISR

- **As part of the transformation of the Armed Forces, it needs to be included along with the design and development of platforms and combat systems**
- **One of the key elements of this is reduced manning, or affordable manning – and NCO can contribute to this**
- **But we need to move away from old approaches, in order to do this**
  - **Organizationally**
  - **From an acquisition perspective**
 - **From a design and development perspective**

Systems Design & Development:
Today's Approach – tends to be linear

Design & Develop

- Networks
- Hardware
- Software
- Processes
- Procedures
- Structures

User Requirements
User Requirements
User Requirements
Requirements
Requirements

Concept Development

Prototype

Test/Eval

Deploy

Train
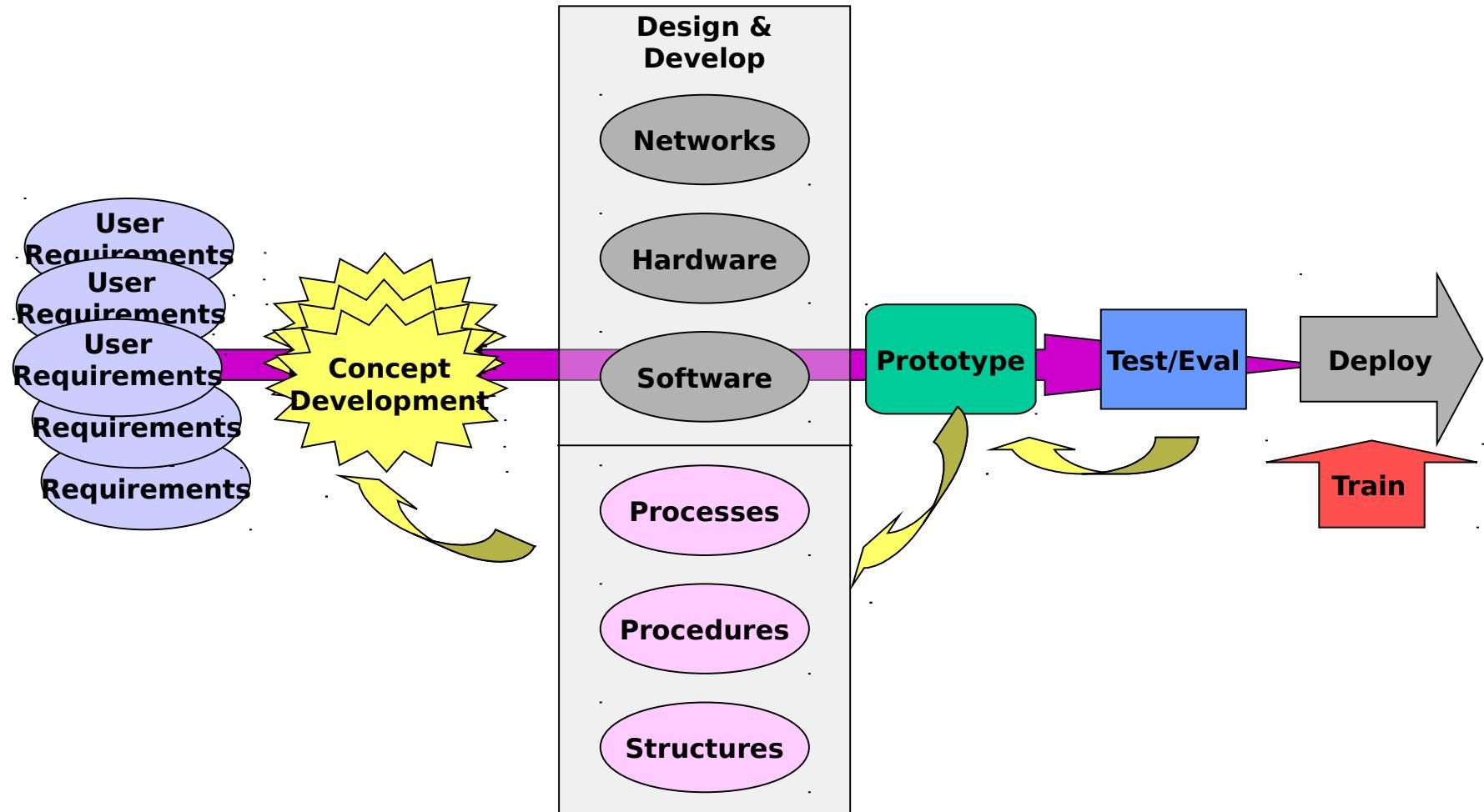
FORCEnet 2020 Information Environment
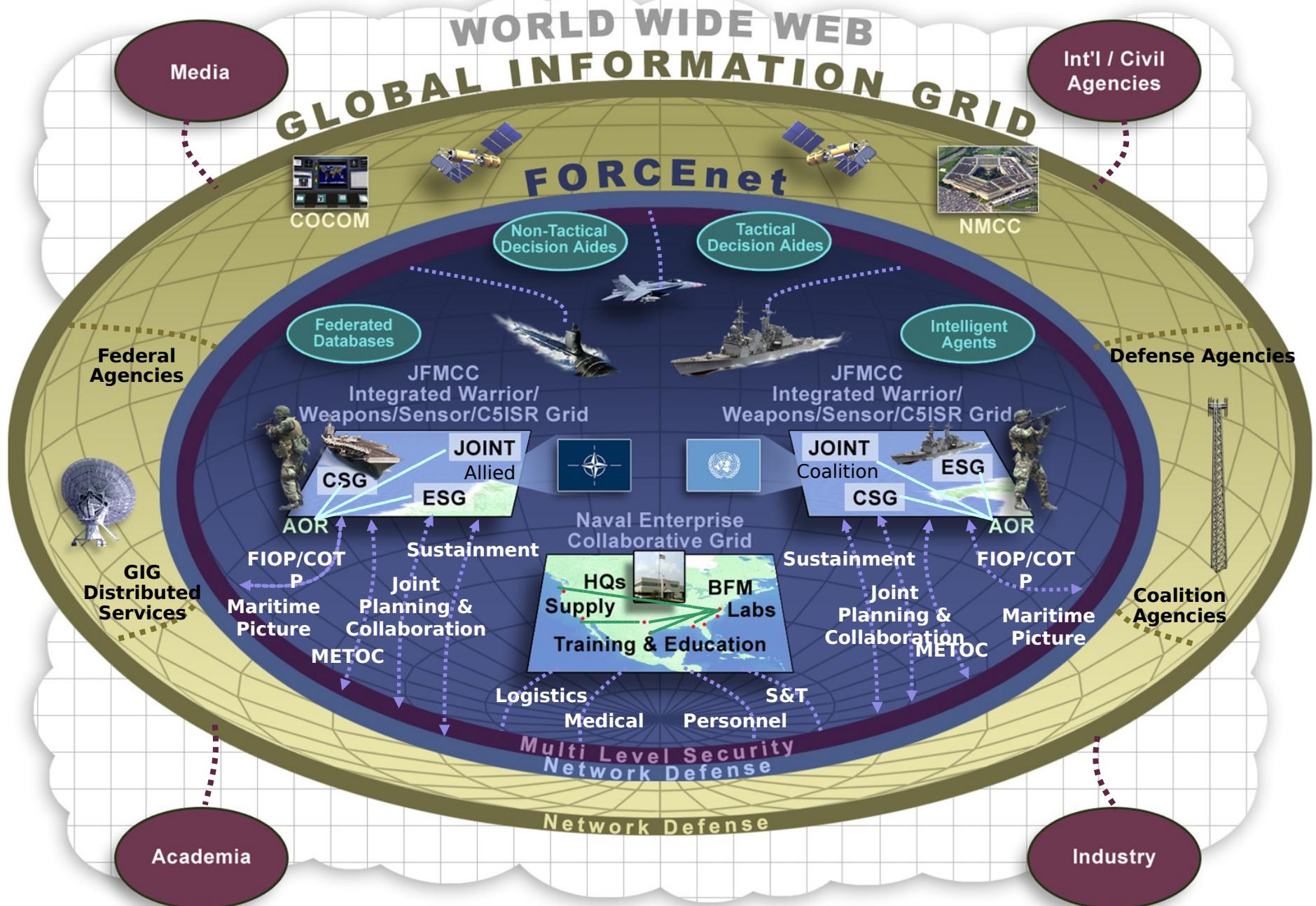
Co-evolutionary Spiral Development Process including technology, people, organization & process – looking into the spiral
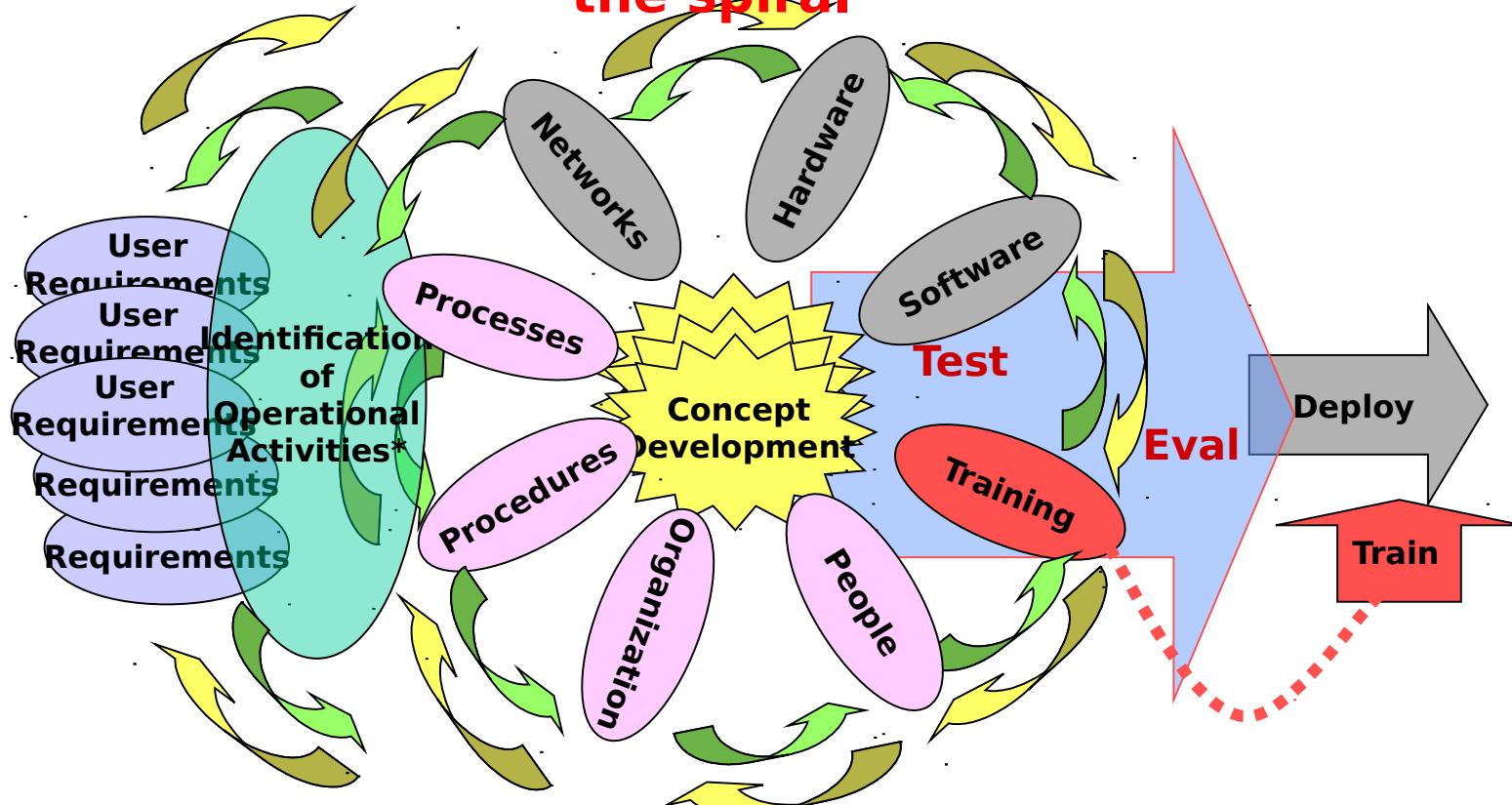
Systems Design & Development: Considerations

Need for a System's View

- **Even with one or two users, the relationships and nuances between themselves and between them and the support functions with which they work can be very complex**
- **Designing pieces of the systems in stovepipes can lead to incompatibilities, and lack of interoperability, not to say inefficiencies**
- **Systems designers MUST listen carefully to the users, and need to get regular feedback – Identify Operational Activities is a good way to do this**
- **When dealing with huge, complex systems with multiple users (FORCEnet, NMCI...) these requirements/problems get magnified**

IP/IT Professionals can have more power and influence than they sometimes realize

- **By designing and developing systems, they can change:**
  - **Operating procedures**
  - **Conventions**
  - **Organizational structures, and**
- **They may place unanticipated constraints on the users**
- **They need to be aware of this possibility, and ensure regular dialog with users**

Bottom Line

- We have examined new types of organizational structures, command structures and problems with them
- We have provided an understanding of cultures, the characteristics of an NCO culture, and potential barriers
- We have looked at future systems' design considerations from an organizational perspective
- We have indicated how organizations will need to transform in order to operate effectively in an NCO environment

Questions

- What do you see as the major issues involved in organizing for NCO?

- What do you see as the major inhibitors to the new organizational approaches?

- What ideas do you have for effective C2 in an NCO environment?

- How can accountability and responsibility be determined in virtual, distributed networks composed of many different organizations?   Or should they?